Mr. Bob Draper
CMX
7740 N 16th Street, #100
Phoenix, AZ 85020

Project A07-0191G
February 20, 2008

Geotechnical Report
New Sewer & Reclaimed Water Lines
Greenway Rd from Litchfield Rd to Bullard Ave
Surprise, Arizona

Dear Mr. Draper:

Submitted herewith is the report of the geotechnical investigation for the subject project. In brief, the report includes a plan of borings, boring logs, laboratory test results, and a description of subsurface conditions. Based on the findings, recommendations are set forth for the design and construction of the sewer and reclaimed water lines.

We appreciate this opportunity to be of service to you. If you have any questions regarding this report, please contact us.

Respectfully submitted,
ACURA ENGINEERING ARIZONA, LLC

Prabhakar (Peter) Rupal, P.E.
President

Enclosure
Copies submitted: 4

February 20, 2008

Mr. Bob Draper
CMX
7740 N 16th Street, #100
Phoenix, Arizona 85020

Geotechnical Report
New Sewer & Reclaimed Water Lines
Greenway Rd/Litchfield-Bullard
Surprise, Arizona

Project Number: A07-0191G

TABLE OF CONTENTS

PURPOSE AND SCOPE

This report presents the results of a geotechnical engineering study for the construction of sewer and reclaimed water lines along Greenway Road from Litchfield Road to Bullard Avenue in Surprise, Arizona. The study was conducted for the purpose of developing general pipeline construction requirements, and was conducted in general accordance with Acura Proposal Number P07-156 dated October 10, 2007. City of Phoenix AP No. 13 was used as a guide for this investigation.

Our field exploration program consisted of exploratory borings drilled to obtain information on subsurface conditions. The locations of the boring are shown on the Site Plan included in Appendix A. Samples were tested to determine physical and engineering characteristics. Results of the field exploration and laboratory tests were analyzed to develop earthwork and pipeline design recommendations for the project. Our results and recommendations are presented herein.

This report has been prepared to summarize the data obtained during this study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report.

PROPOSED CONSTRUCTION

The project is to consist of the construction of approximately 1 mile of new sewer and reclaimed water lines along the north side of Greenway Road from Litchfield Road to Bullard Avenue. The sewer line is to made of ductile iron and the reclaimed water line is to be plastic. The pipeline depth is expected to be less than 20 feet. Installation is presumed to be by the traditional cut-and-cover method.

If locations or conditions are significantly different from those described, or as depicted in this report, we should be notified so that we may re-evaluate the recommendations provided herein.

SITE DESCRIPTION

Greenway Road between Litchfield Road and Bullard Avenue is currently a paved 2-lane thoroughfare with left and right-turn lanes at the intersections. The area has a southeasterly trending slope. Adjacent land use is a mix of vacant land, residential, commercial, and municipal. Underground and overhead utilities are currently present along the alignment.

FIELD EXPLORATION

Five borings were drilled at the approximate locations shown on the Site Plans included in Appendix A to explore the subsurface conditions. The locations of the exploratory borings were established in the field using standard taping and/or pacing techniques relative to existing landmarks.

The drill crew advanced the borings through the soils with a CME-55 drill rig using a 7-inch diameter hollow stem auger. Our field geologist logged the borings and obtained samples for laboratory analysis. The exploratory borings were backfilled with auger cuttings upon completion of all drilling activities.

Samples of the subsurface materials were obtained with either a 2.0-inch standard split spoon sampler or a 2.42-inch inside diameter, ring-lined barrel sampler in general accordance with ASTM Method D1586, Split Barrel Sampling. The samplers were driven into the various strata using a 140-pound hammer falling 30 inches. The number of blows required to advance each respective sampler was recorded as the penetration resistance (SPT or N) value. Penetration resistance values provide an indication of the relative density of granular soils or consistency of fine-grained soils. Depths at which the samples were obtained and the penetration resistance values are shown on the attached exploratory boring logs.

SUBSURFACE PROFILE AND ENGINEERING PROPERTIES

Subsurface Profile

The subsurface profile is comprised of sandy clay and clayey sand overlying silty and/or clayey sand, poorly graded silty sand, sandy clay, and possible high-plasticity clay. Subordinate amounts of gravel and varying degrees of calcareous cementing were present. Standard penetration resistance (N) values ranged from about 23 to +50 blows per foot. The soils sampled are described as being damp based on visual and tactile evaluation at the time of investigation. Groundwater was not encountered in the test borings during the investigation. The groundwater table is reported to be greater than 400 feet deep in the area.

The boring logs should be referenced for complete soil descriptions and classifications, interpolated thickness of the strata, and penetration resistance (N) values.

Field resistivity measurements were taken adjacent each boring location. These results are summarized in Appendix C.

Laboratory Test Results

Samples of soil obtained during the field exploration were observed and visually classified in accordance with ASTM D2487, which is based on the Unified Soil Classification System. Samples were selected for testing to determine the engineering and physical properties in general accordance with ASTM or other generally recognized procedures. Results of all laboratory tests are presented in Appendix B.

To summarize, the in-place dry densities of the soils sampled ranged from 93 pcf to 114 pcf at natural water contents of about 3 to 13 percent at the time of investigation. Liquid limits range from 25 to 31 percent and plasticity ranges from 4 to 12 percent. Soil pH ranges from 8.0 to 9.1, chlorides and soluble sulfates ranged from 15 to 25 parts per million (ppm) and 13 to 23 ppm, respectively. Laboratory-measured minimum resistivity values ranged between 1,780 and 2,675 ohm-cm.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

Open cut excavation should be feasible for installation of the proposed water line. Care should be taken during excavation not to endanger nearby existing structures, including the roadway and utilities (overhead and underground). Depending on proximity, existing structures, utilities and other elements may require shoring, bracing or underpinning to provide structural stability and protect personnel working in the excavation.

Very dense and/or cemented conditions (possible caliche), and coarse gravels and possible cobbles or boulders may impede excavation progress and the ability to cut neat trenches. It should be noted that the fact that a boring was advanced to a particular depth should not lead to the assumption that it is necessarily excavatable by conventional means. Very dense, hard, and/or cemented conditions may require more aggressive removal techniques. Sloughing may occur in fills (compacted and uncompacted), sandy or loose deposits, requiring the laying back of side slopes.

For preliminary design and consideration and costing, soils within the upper 8 feet may be laid back at 1H:1V. Between 8 feet and 25 feet depth, side slopes may be laid back at ¾:1. The slopes should be protected from erosion due to run-off or long-term surcharge at the slope crest. Construction equipment, building materials, excavated soil and vehicular traffic should not be allowed within 10 feet or ⅓ the slope height, whichever is greater, from the top of slope. A geotechnical engineer retained by the contractor should observe all cut slopes during excavation. Adjustments to the recommended slopes may be necessary due to wet zones, loose strata and other conditions not observed in the borings. Localized shoring may also be required. Shotcrete or soil stabilizer on the slope face may be useful in preventing erosion due to run-off and/or drying of the slope.

Note that the preceding comments are provided for the use of the designer only. The contractor should make his own independent assessment of site conditions and satisfy himself as to construction/excavation means and methods. The fact that a boring was advanced to a particular depth should not lead to the assumption that it is necessarily excavatable by conventional means. Dense and/or cemented conditions may require more aggressive removal techniques. All excavations should be constructed in accordance with relevant governmental regulations including but not limited to OSHA. Maintenance of safe excavations and trenches is considered solely the responsibility of the contractor.

Groundwater is not expected to be a factor in the design and construction of underground utilities to the depths anticipated.

The nature and extent of subsurface variations across the site may not become evident until construction. If during construction fill, soil, rock, or water conditions appear to be different from those described herein, this office should be advised at once so that we may re-evaluate the recommendations made.

The results of pH and resistivity testing should be submitted to a corrosion protection expert to determine how best to protect the pipe keeping in mind that suitable pipe wall thickness and corrosion protection should be selected per the trench/traffic load and lifetime requirements of the project.

Subsurface concrete should use Type I, or Type II cement, both readily available and used in the area.

UTILITY INSTALLATION

All trench excavations should be constructed in accordance with relevant governmental regulations including but not limited to OSHA. Maintenance of safe trenches is considered solely the responsibility of the contractor. Slouging may occur in fills (uncompacted and compacted), sandy or loose deposits, requiring the laying back of side slopes. The contractor should make his own independent assessment in regard to excavation methods. See “Analysis” section for additional commentary.

Backfill of utility trenches outside of the pipe-bedding zone may be carried out with native excavated material provided particles in excess of 3 inches are first removed. Bedding should be selected per the requirements of the pipe materials used and the trench loading conditions.

If import material is required to achieve the desired finished ground surface elevations, it should consist of non-expansive, imported fill free of organics and deleterious material, meeting all of the following specification requirements:

Maximum particle size	3 inches
Maximum percent passing #200 sieve	50
Maximum plasticity index (PI)	10
Maximum liquid limit (LL)	30
Maximum swell (under 100 psf surcharge)	1.5 percent

Fill should be placed on subgrade that has been properly prepared and approved by a Soils Engineer. Fill must be wetted and thoroughly mixed to achieve moisture content within 2 percent of optimum moisture. Fill should be placed in horizontal lifts of 8-inch thickness (or as dictated by compaction equipment) and compacted to the percent of its maximum dry density per ASTM D-698 set forth as follows, or to City of Surprise or MAG standards, the more stringent to govern:

A.	Pavement Subgrade or Fill		95
B.	Utility Trench Backfill		
	1.	More than 2.0 feet below finish subgrade	95
	2.	Within 2.0 feet of finish subgrade (non-granular)	95
	3.	Within 2.0 feet of finish subgrade (granular)	100
C.	Aggregate Base Course		
	1.	Below asphalt paving	100
D.	Landscape Areas		
	1.	Miscellaneous fill	90
	2.	Utility trench - more than 1.0 foot below finish grade	85
	3.	Utility trench - within 1.0 foot of finish grade	90

CONTINUING SERVICE

Two additional elements of geotechnical engineering service are important to the successful completion of this project.

Consultation with design professionals during the design phases. This is important to ensure that the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects.

Observation and monitoring during construction. A geotechnical engineer or technician from our firm should observe the excavation and earthwork phases of the work to determine that subsurface conditions are compatible with those used in the analysis and design. Placement of backfill should be observed and tested to confirm that the proper density has been achieved.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon the design data submitted to Acura Engineering, data obtained from the exploratory borings drilled at the location indicated on the Site Plan included in Appendix A, and the proposed construction discussed in this report. No other warranty, expressed or implied, is made as to the professional advice set forth.

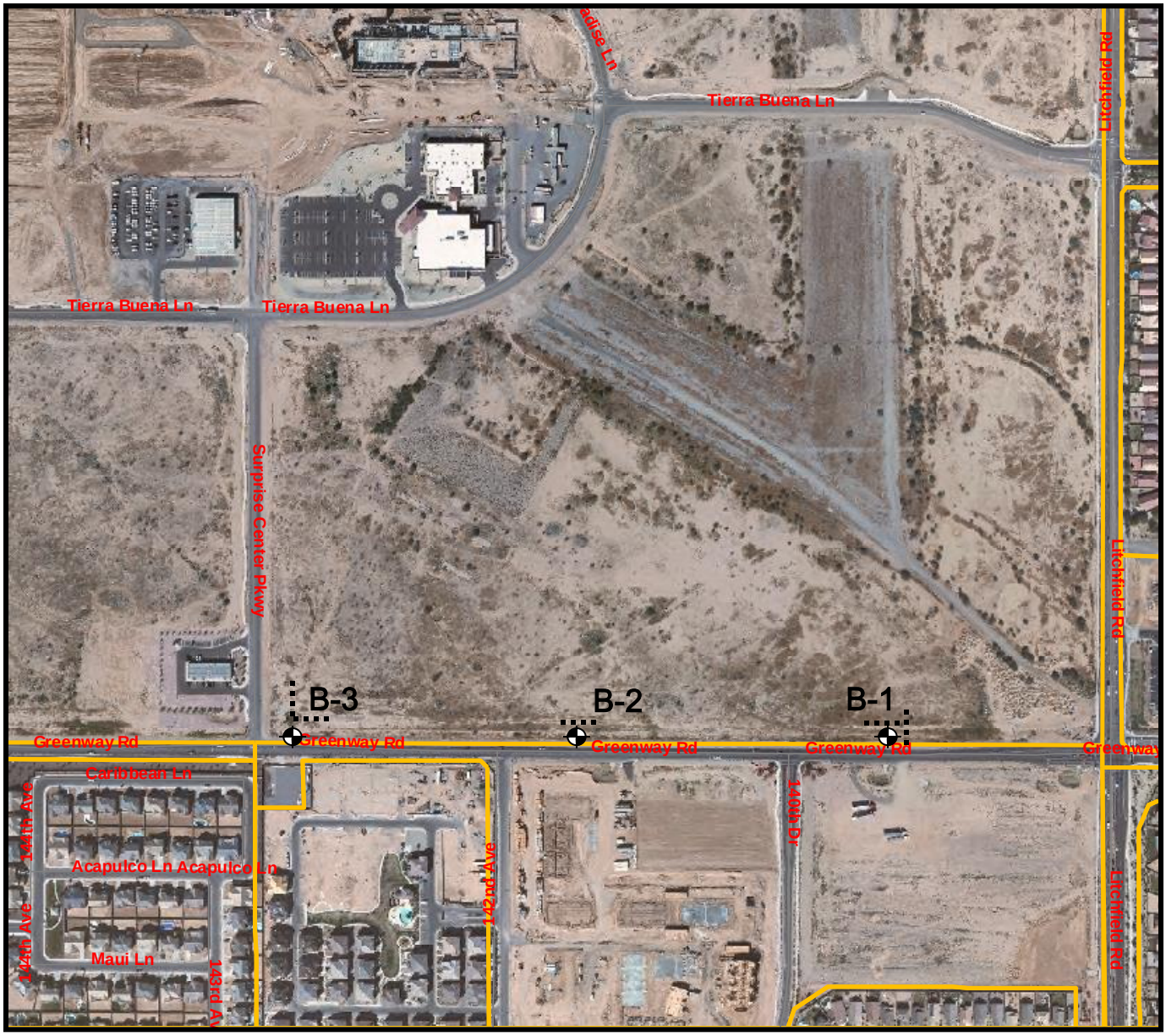
Acura's scope of work does not include the investigation, detection, or design related to the presence of any biological pollutants. The term 'biological pollutants' includes, but is not limited to mold, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms. The scope of this investigation and report does not include regional considerations such as seismic activity and ground fissures resulting from subsidence due to groundwater withdrawal, nor any considerations of hazardous releases or toxic contamination of any type.

The nature and extent of subsurface variations across the site may not become evident until construction. If during construction fill, soil, rock, or water conditions appear to be different from those described herein, this office should be advised at once so that we may re-evaluate the recommendations made.

This report has been prepared for the exclusive use by our client for design purposes. We are not responsible for technical interpretations by others of our exploratory information that has not been described or documented in this report. This report should not be used by the contractor as the sole tool for bidding quantities or establishing construction/excavation methods. The contractor should

make his own independent assessment in these regards. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted. Significant design changes may require additional analysis or modifications of the recommendations presented herein. We recommend on-site observation of excavations and testing of fills by a representative of the geotechnical engineer.

Appendix A
Field Results



Source: Maricopa County, AZ
Assessors Web Site

Acura ENGINEERING

5235 South 39th Street
Phoenix, Arizona

Project No.: A07-0191G

Name & Location:
New Sewer & Reclaimed Water Lines
Greenway Rd from Litchfield to Bullard
Phoenix,AZ

Approximate Boring Location

Field Resistivity Test Line

Source: Maricopa County, AZ
Assessors Web Site

N

Source: Maricopa County, AZ

Assessors Web Site

Acura ENGINEERING

5235 South 39th Street
Phoenix, Arizona

Project No.: A07-0191G

Name & Location:
New Sewer & Reclaimed Water Lines
Greenway Rd from Litchfield to Bullard
Phoenix,AZ

Approximate Boring Location

Field Resistivity Test Lines

Source: Maricopa County, AZ Assessors Web Site

N

LEGEND AND NOTES

SOIL TYPE


GW, Well-Graded Gravel


SW, Well-Graded Sand


ML, Silt


GP, Poorly-Graded Gravel


SP, Poorly-Graded Sand


CL, Lean Clay


GM, Silty Gravel


SM, Silty Sand


CH, Fat Clay


GC, Clayey Gravel


SC, Clayey Sand


Fill, Unclassified

Note: Dual or modified symbols may be used for borderline soil classifications or to provide better graphical depiction of the soil.

SAMPLER TYPES


Split-Spoon


Modified Dames and Moore


Auger

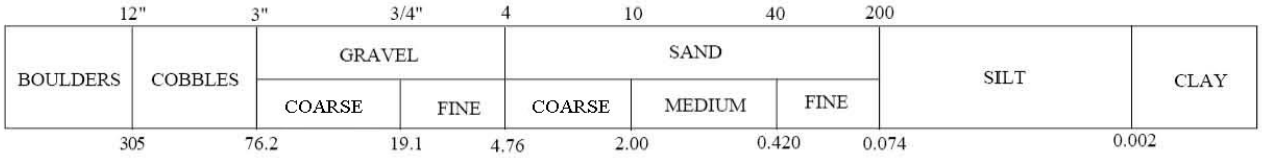

Shelby Tube

GROUNDWATER


Groundwater Level

SOIL GRAIN SIZE

U.S.STANDARD SIEVE



SOIL GRAIN SIZE IN MILLIMETERS

STRENGTH OF COHESIVE SOILS

CONSISTENCY	NUMBER OF BLOWS PER FT., N	UNDRAINED SHEAR STRENGTH Kips Per Sq. Ft.
Very Soft	0 - 2	Less Than 0.25
Soft	3 - 4	0.25 to 0.50
Firm	5 -8	0.50 to 1.00
Stiff	9 - 15	1.00 to 2.00
Very Stiff	16 - 30	2.00 to 4.00
Hard	Over 30	Greater Than 4.00

DENSITY OF NON-COHESIVE SOILS

NUMBER OF BLOWS PER FT., N	RELATIVE DENSITY
0 - 4	Very Loose
4 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
Over 50	Very Dense

Criteria for Describing Moisture Condition

Description	Criteria
Damp	Dusty, dry to the touch
Moist	Damp but no visible of water
Wet	Visible free water, usually soil is below water table

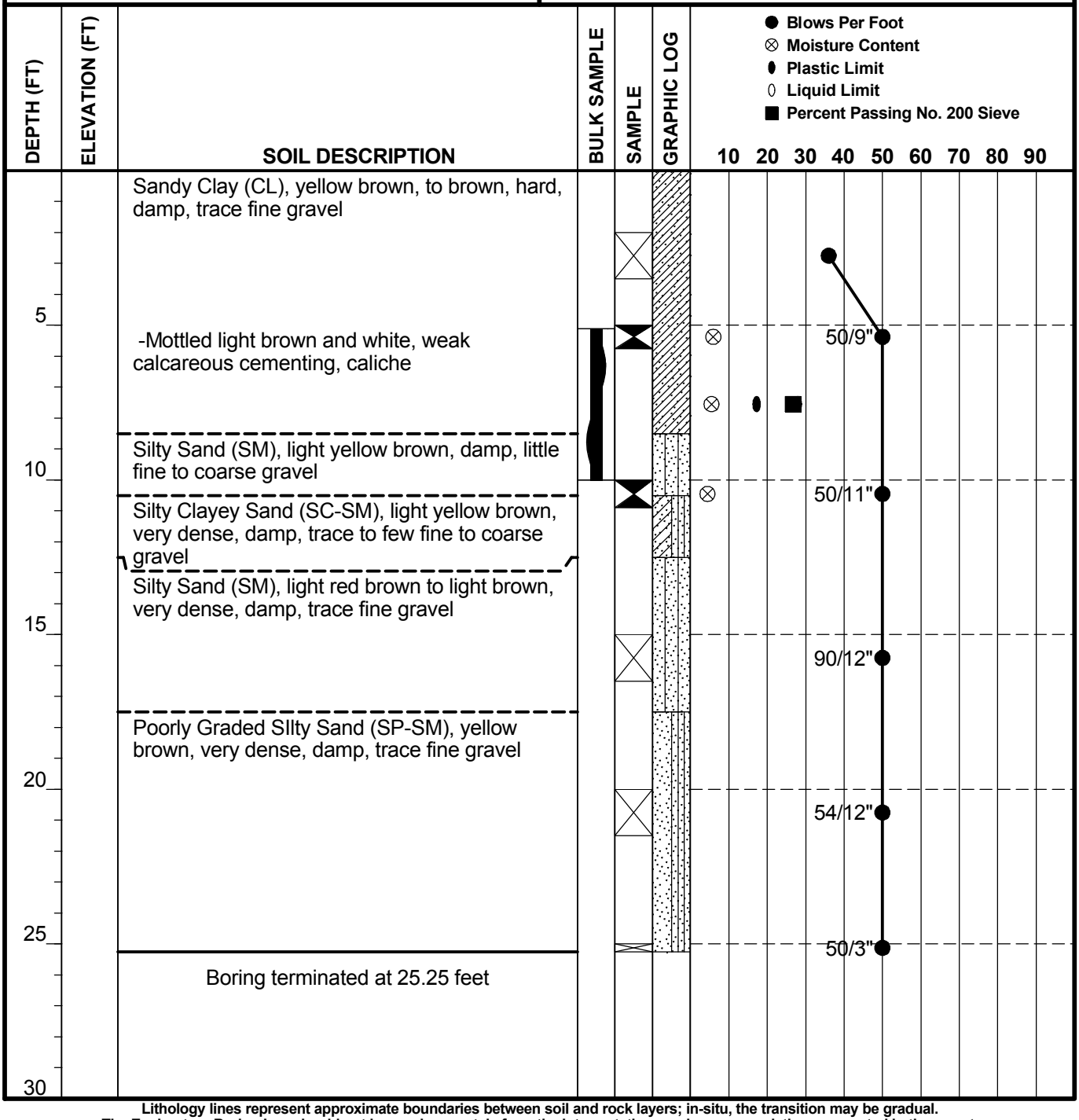
ASTM D 2488 Note 16 Criteria for Describing Percentages of Gravel, Sand and Fines

Description	Criteria
Trace	Particles are present but estimated to be less than 5 %
Few	5 to 10 %
Little	15 to 25 %
Some	30 to 45 %
Mostly	50 to 100 %

Acura ENGINEERING

Boring No. B-1
Sheet 1 of 1

Logged By: J Householder	**Project No.: A07-0191G**
Driller: D & S Drilling, Inc	**Project Name: New Sewer & Reclaimed Water Lines**
Auger/Core Type: 7" Hollow Stem Auger	
Approximate Elevation (ft): Not Available	**Location: Greenway Rd from Litchfield Rd to Bullard Surprise, AZ**
Total Boring Depth (ft): 25.25	
Other: None	**Date Started: 1/25/2008 Date Completed: 1/25/2008**
	Depth to Groundwater (ft): No Water

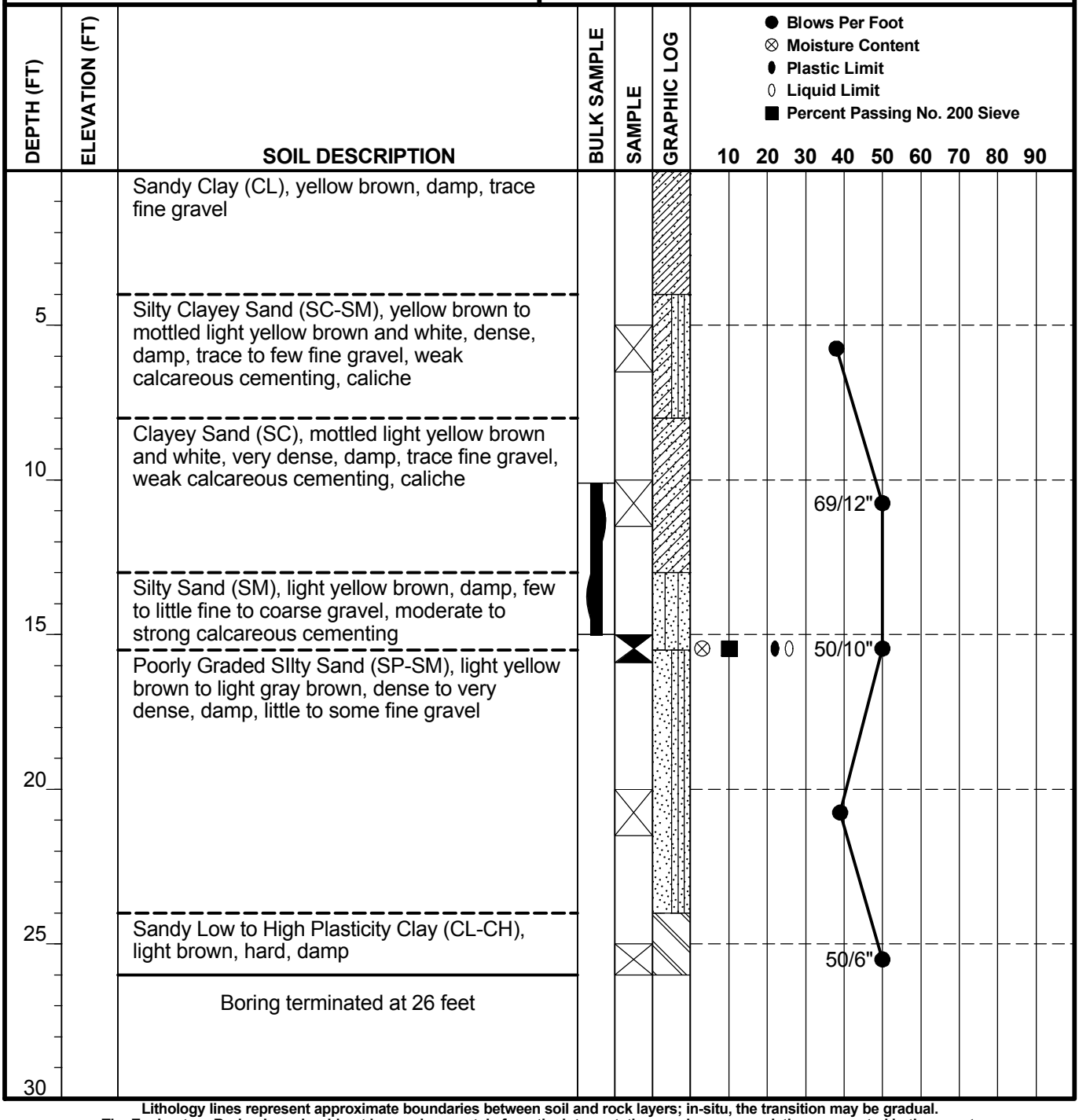


Lithology lines represent approximate boundaries between soil and rock layers; in-situ, the transition may be gradual.
The Exploratory Boring Log should not be used separately from the interpretations and recommendations presented in the report.

Acura ENGINEERING

Boring No. B-2
Sheet 1 of 1

Logged By: J Householder	**Project No.: A07-0191G**
Driller: D & S Drilling, Inc	**Project Name: New Sewer & Reclaimed Water Lines**
Auger/Core Type: 7" Hollow Stem Auger	
Approximate Elevation (ft): Not Available	**Location: Greenway Rd from Litchfield Rd to Bullard Surprise, AZ**
Total Boring Depth (ft): 26	
Other: None	**Date Started: 1/25/2008 Date Completed: 1/25/2008**
	Depth to Groundwater (ft): No Water

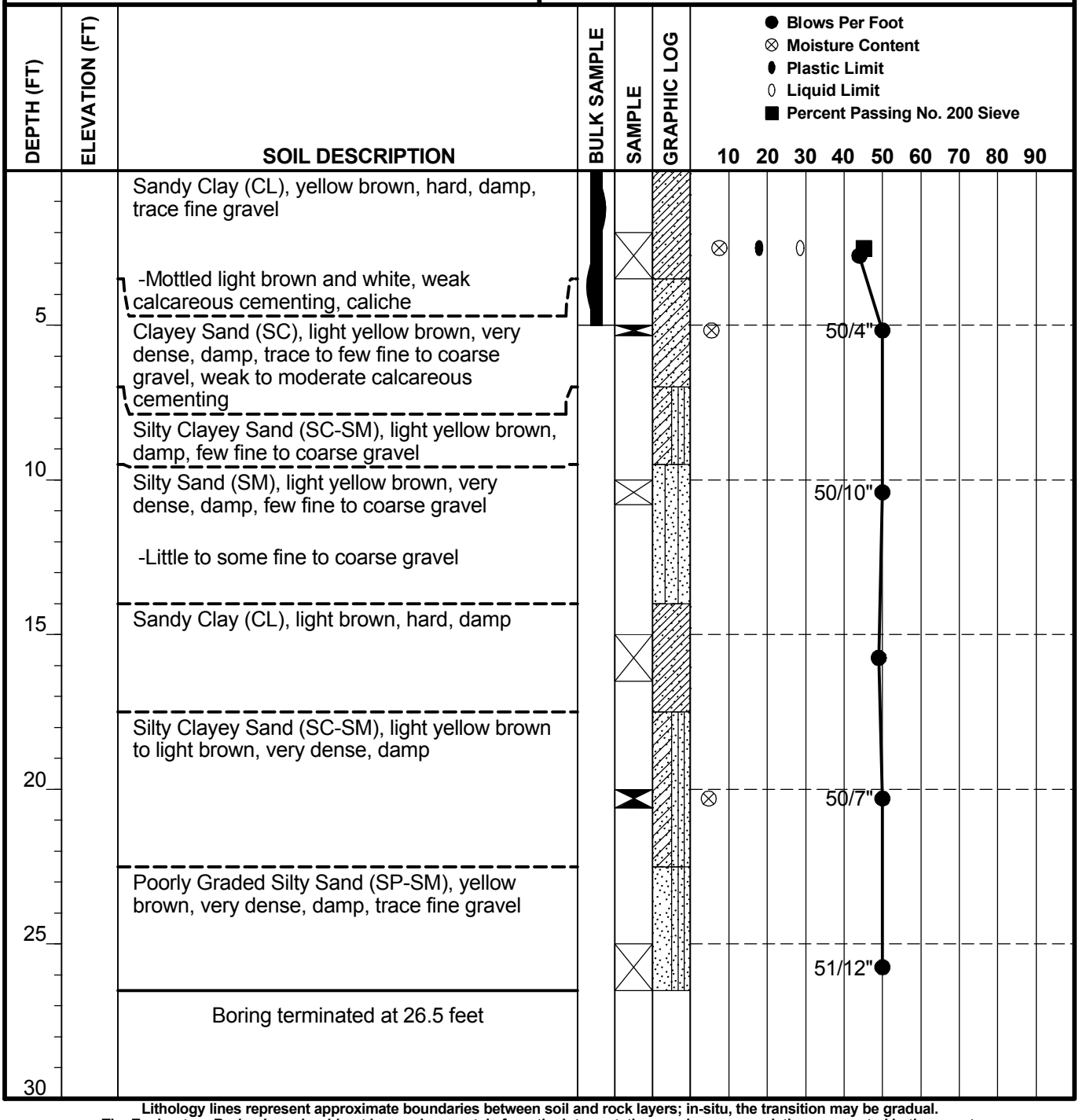


Lithology lines represent approximate boundaries between soil and rock layers; in-situ, the transition may be gradual.
The Exploratory Boring Log should not be used separately from the interpretations and recommendations presented in the report.

Acura ENGINEERING

Boring No. B-3
Sheet 1 of 1

Logged By: J Householder	**Project No.: A07-0191G**
Driller: D & S Drilling, Inc	**Project Name: New Sewer & Reclaimed Water Lines**
Auger/Core Type: 7" Hollow Stem Auger	
Approximate Elevation (ft): Not Available	**Location: Greenway Rd from Litchfield Rd to Bullard Surprise, AZ**
Total Boring Depth (ft): 26.5	
Other: None	**Date Started: 1/25/2008 Date Completed: 1/25/2008**
	Depth to Groundwater (ft): No Water

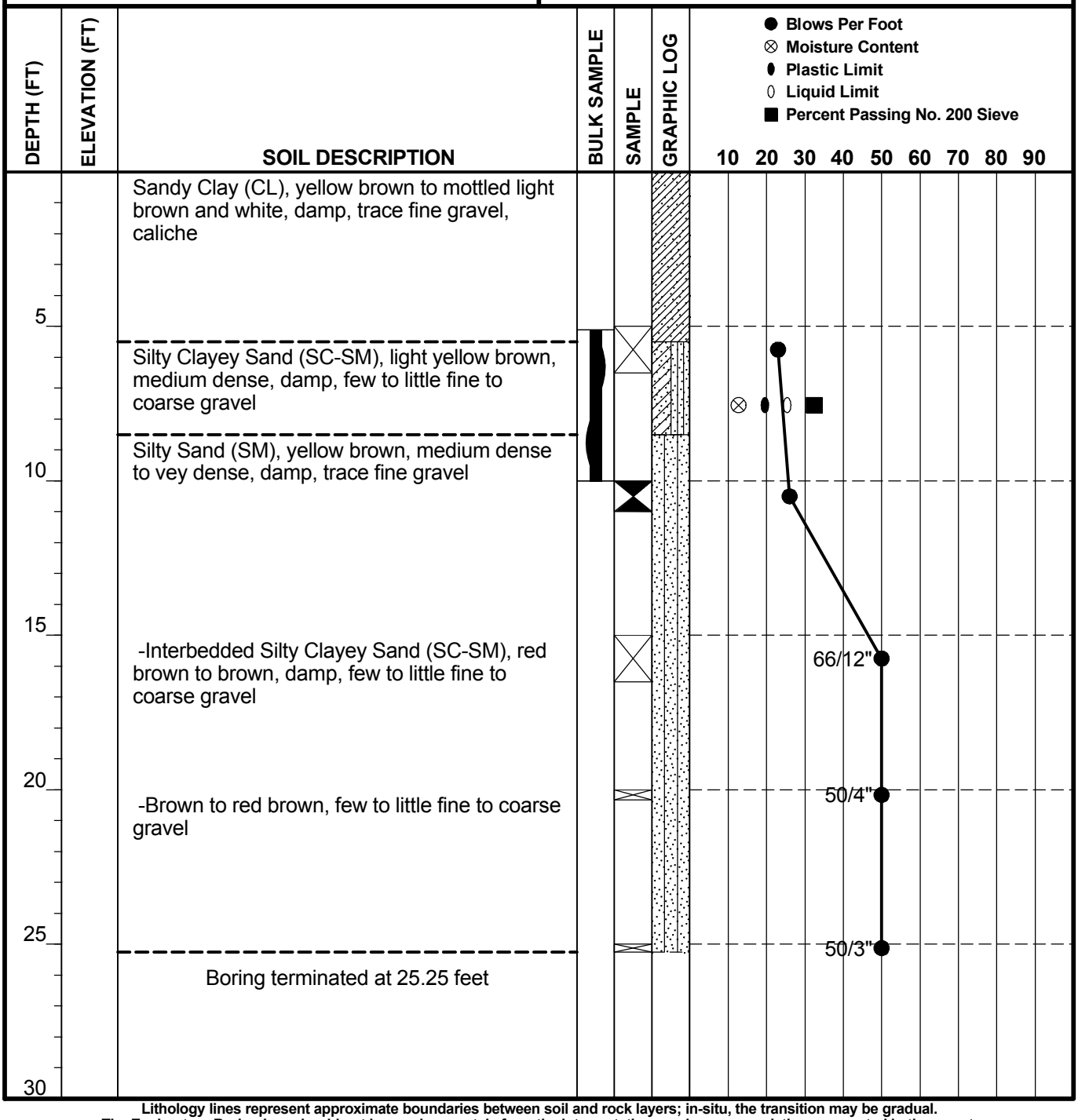


Lithology lines represent approximate boundaries between soil and rock layers; in-situ, the transition may be gradual.
The Exploratory Boring Log should not be used separately from the interpretations and recommendations presented in the report.

Acura ENGINEERING

Boring No. B-4
Sheet 1 of 1

Logged By: J Householder	**Project No.: A07-0191G**
Driller: D & S Drilling, Inc	**Project Name: New Sewer & Reclaimed Water Lines**
Auger/Core Type: 7" Hollow Stem Auger	
Approximate Elevation (ft): Not Available	**Location: Greenway Rd from Litchfield Rd to Bullard Surprise, AZ**
Total Boring Depth (ft): 25.25	
Other: None	**Date Started: 1/25/2008 Date Completed: 1/25/2008**
	Depth to Groundwater (ft): No Water

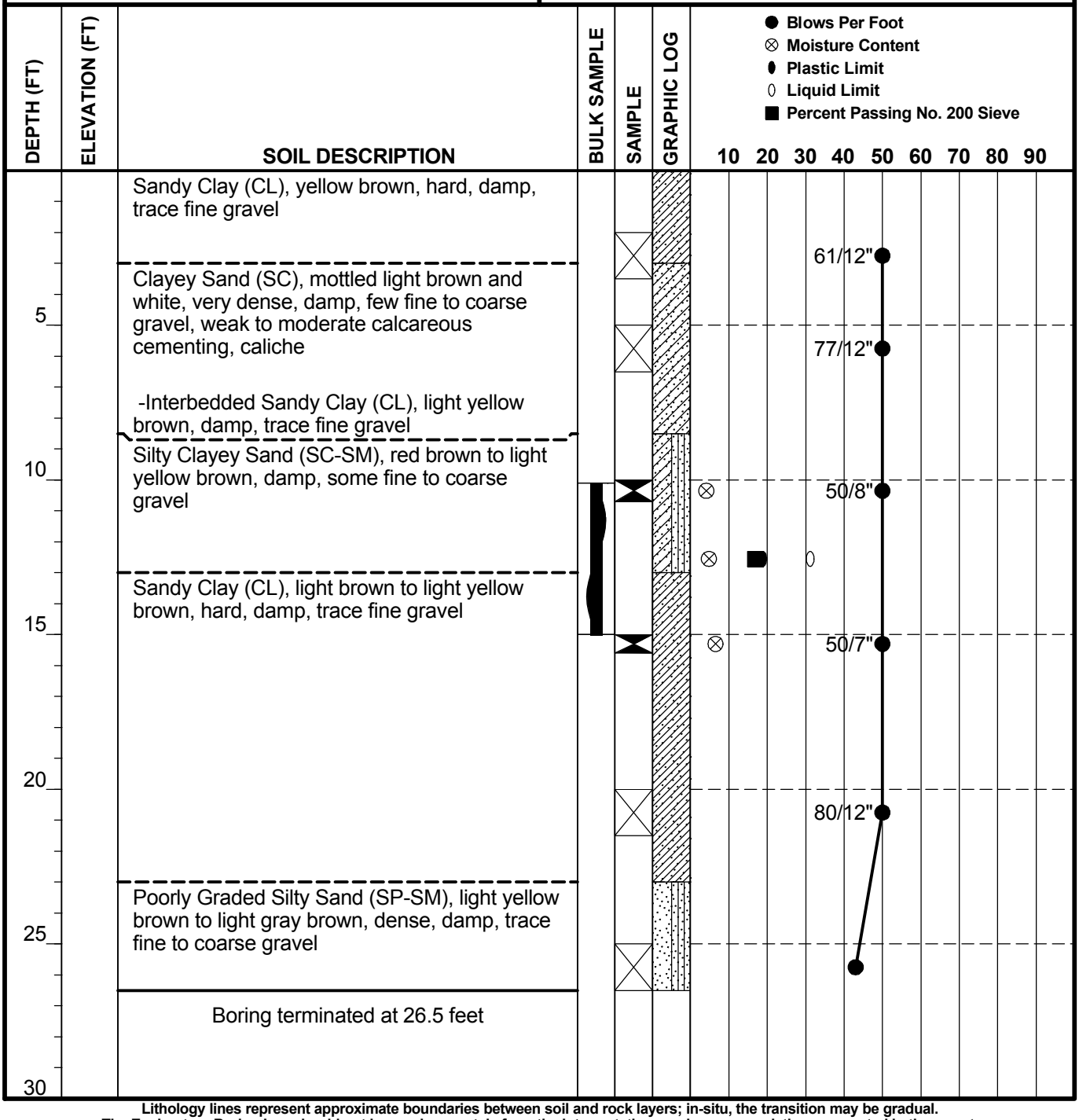


Lithology lines represent approximate boundaries between soil and rock layers; in-situ, the transition may be gradual.
The Exploratory Boring Log should not be used separately from the interpretations and recommendations presented in the report.

Acura ENGINEERING

Boring No. B-5
Sheet 1 of 1

Logged By: J Householder	**Project No.: A07-0191G**
Driller: D & S Drilling, Inc	**Project Name: New Sewer & Reclaimed Water Lines**
Auger/Core Type: 7" Hollow Stem Auger	
Approximate Elevation (ft): Not Available	**Location: Greenway Rd from Litchfield Rd to Bullard Surprise, AZ**
Total Boring Depth (ft): 26.5	
Other: None	**Date Started: 1/25/2008 Date Completed: 1/25/2008**
	Depth to Groundwater (ft): No Water



Lithology lines represent approximate boundaries between soil and rock layers; in-situ, the transition may be gradual.
The Exploratory Boring Log should not be used separately from the interpretations and recommendations presented in the report.

Appendix B
Laboratory Test Results

Sample	Natural Moisture (%)	In-Place Dry Density (pcf)	Atterberg Limits		Grain Size Distribution (% Finer)					pH	Resistivity (ohm-cm)	Soluble Sulfates (ppm)	Chlorides (ppm)	USCS
			LL	PI	#200	#40	#10	#4	3"					
B-1 @ 5-5.75'	5.9	93.7	-	-	-	-	-	-	-	-	-	-	-	-
B-1 @ 5.1-10'	5.5	-	28	11	27	51	73	82	-	8.7	2,400	13	21	SC
B-1 @ 10-10.9'	4.4	103.5	-	-	-	-	-	-	-	-	-	-	-	-
B-2 @ 15-15.9'	3.0	114.0	26	4	10	36	62	73	-	-	-	-	-	SP-SM
B-3 @ 0-5'	7.5	-	29	11	45	75	88	90	-	8.0	1,780	18	25	SC
B-3 @ 5-5.33'	5.5	92.7	-	-	-	-	-	-	-	-	-	-	-	-
B-3 @ 20-20.6'	4.7	102.5	-	-	-	-	-	-	-	-	-	-	-	-
B-4 @ 5.1-10'	12.7	-	25	5	32	59	82	88	-	-	-	-	-	SC-SM
B-5 @ 10-10.7'	4.1	106.9	-	-	-	-	-	-	-	-	-	-	-	-
B-5 @ 10.1-15'	4.8	-	31	12	17	33	54	68	-	9.1	2,675	23	15	SC
B-5 @ 15-15.6'	6.5	98.9	-	-	-	-	-	-	-	-	-	-	-	-

NV - no value
NP - non-plastic
NOTE: Sieve analysis results do not include particle sizes greater than 3" in diameter. Refer to boring logs for notes on presence of cobbles and boulder-sized particles.

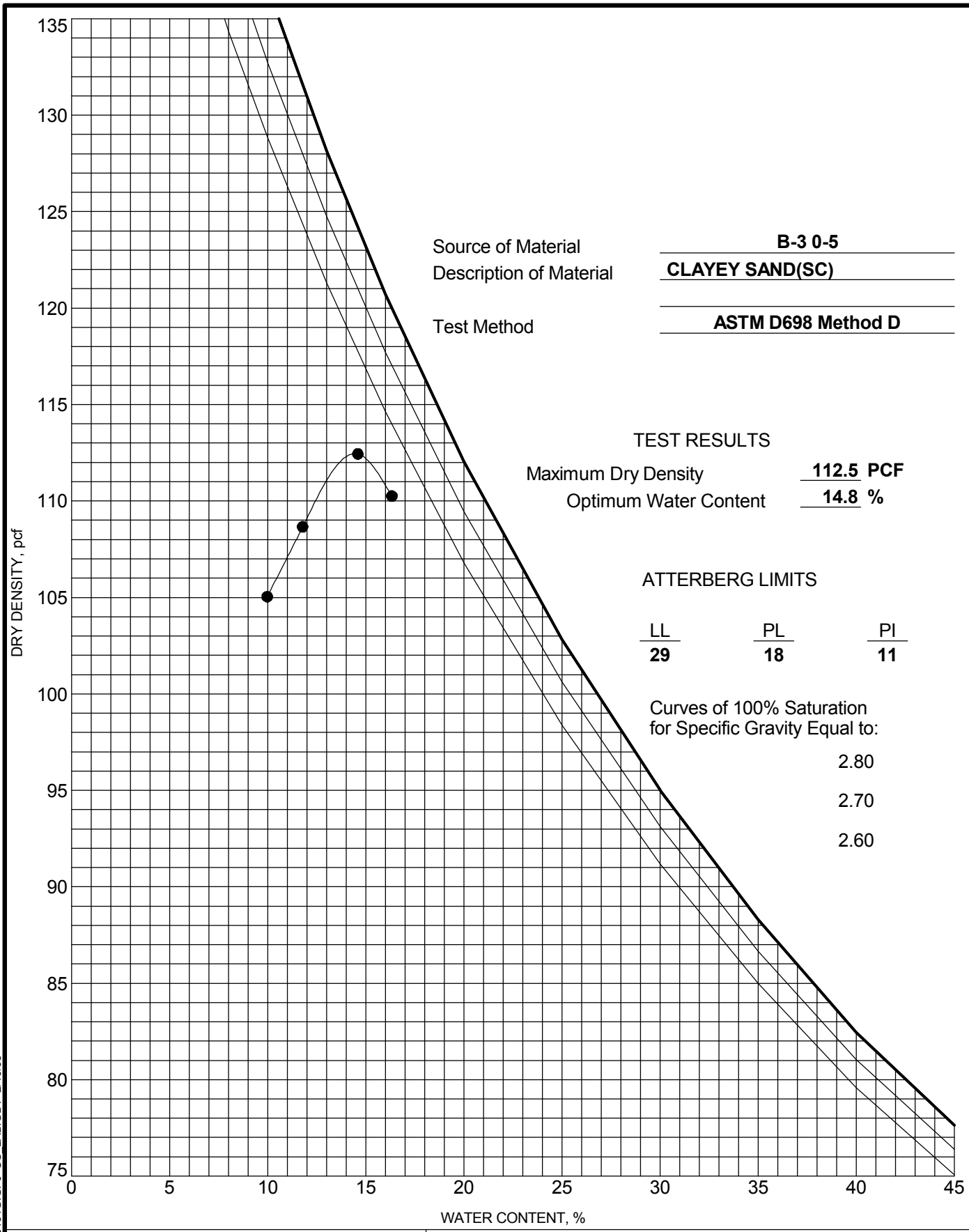
Acura Engineering
5235 South 39th Street
Phoenix, Arizona 85040
Telephone: 602-458-7484
Fax: 602-458-9246

LABORATORY TEST SUMMARY

Project Name: New Sewer & Reclaimed Water Lines

Location: Greenway Rd from Litchfield Rd to Bullard
Surprise, AZ

Project No.: A07-0191G



Source of Material: **B-3 0-5**

Description of Material: **CLAYEY SAND(SC)**

Test Method: **ASTM D698 Method D**

TEST RESULTS

Maximum Dry Density: **112.5 PCF**

Optimum Water Content: **14.8 %**

ATTERBERG LIMITS

LL	PL	PI
29	**18**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

Acura Engineering
5235 South 39th Street
Phoenix, Arizona 85040
Telephone: 602-458-7484
Fax: 602-458-9246

MOISTURE-DENSITY RELATIONSHIP

Project Name: New Sewer & Reclaimed Water Lines

Location: Greenway Rd from Litchfield Rd to Bullard
Surprise, AZ

Project No.: A07-0191G

MOTZZ LABORATORY, INC.
2109 S 48th St Suite 101
Tempe AZ 85282

Soil Analysis Report

Acura Engineering
James Householder
5235 S. 39th St
Phoenix, AZ 85040-9008

Project: 0191G
Sampler:
Date Received: 2/15/2008
Date Reported: 2/19/2008

PO Number: 0191G

Lab Number: 9521-01 **B1 (5-10)**

Sulfate-S & Chloride	Method	Result	Units	Levels
Sulfate-S, SO4-S	ARIZ 733	13	ppm	
Chloride, Cl	ARIZ 736	21	ppm	

Lab Number: 9521-02 **B3 (0-5)**

Sulfate-S & Chloride	Method	Result	Units	Levels
Sulfate-S, SO4-S	ARIZ 733	18	ppm	
Chloride, Cl	ARIZ 736	25	ppm	

Lab Number: 9521-03 **B5 (10-15)**

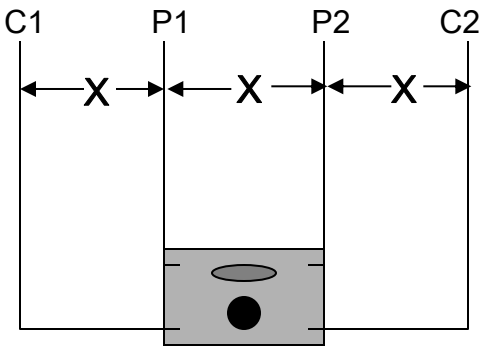
Sulfate-S & Chloride	Method	Result	Units	Levels
Sulfate-S, SO4-S	ARIZ 733	23	ppm	
Chloride, Cl	ARIZ 736	15	ppm	

Appendix C
Field Resistivity Test Results

Ohm-cm = x191.5(R)

X=Spacing (feet)

R=Resistance (Ohms)



SPACING (Feet)	B-1/Test #1 Resistance (Ohms) East-West	B-1/Test #1 Ohm-Centimeter (Ohm-cm) East-West	B-1/Test #2 Resistance (Ohms) North-South	B-1/Test #2 Ohm-Centimeter (Ohm-cm) North-South
5	8.01	7,670	9.13	8,742
10	5.28	10,110	6.41	12,275
15	3.47	9,970	3.83	11,000
20	2.22	8,505	2.22	8,505
25	1.51	7,230	1.87	8,955
30				

Acura ENGINEERING

5235 South 39th Street
Phoenix, Arizona

Project No.: A07-0191G

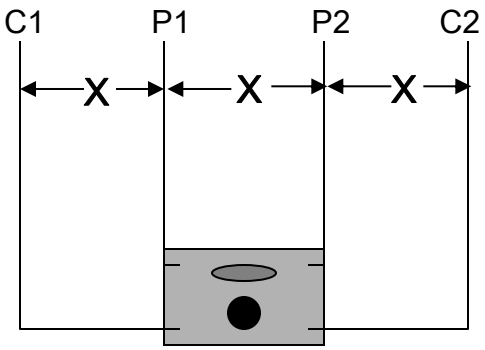
Name & Location:
New Sewer & Reclaimed Water Line
Greenway Rd from
Litchfield to Bullard
Surprise, AZ

FIELD RESISTIVITY
TEST RESULTS

Ohm-cm = x191.5(R)

X=Spacing (feet)

R=Resistance (Ohms)



SPACING (Feet)	B-2/Test #1 Resistance (Ohms) East-West	B-2/Test #1 Ohm-Centimeter (Ohm-cm) East-West	Test #2 Resistance (Ohms) North-South	Test #2 Ohm-Centimeter (Ohm-cm) North-South
5	9.83	9,410		
10	4.48	8,580		
15	2.79	8,015		
20	1.56	5,975		
25	1.28	6,130		
30				

Acura ENGINEERING

5235 South 39th Street
Phoenix, Arizona

Project No.: A07-0191G

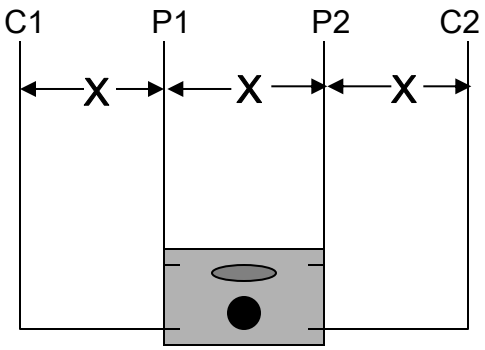
Name & Location:
New Sewer & Reclaimed Water Line
Greenway Rd from
Litchfield to Bullard
Surprise, AZ

FIELD RESISTIVITY TEST RESULTS

Ohm-cm = x191.5(R)

X=Spacing (feet)

R=Resistance (Ohms)



SPACING (Feet)	B-3/Test #1 Resistance (Ohms) East-West	B-3/Test #1 Ohm-Centimeter (Ohm-cm) East-West	B-3/Test #2 Resistance (Ohms) North-South	B-3/Test #2 Ohm-Centimeter (Ohm-cm) North-South
5	13.85	13,260	8.29	7,940
10	7.38	14,135	4.91	9,405
15	3.95	11,345	3.14	9,020
20	2.66	10,190	2.83	10,840
25	1.64	7,850	2.48	11,875
30				

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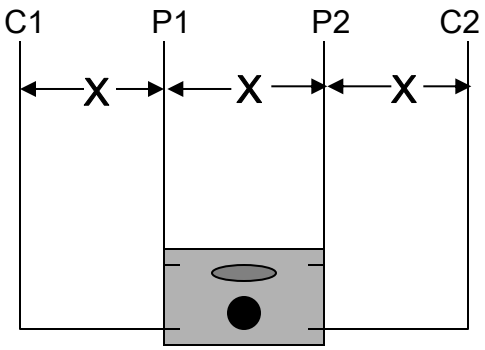

SPACING (Feet)	B-4/Test #1 Resistance (Ohms) East-West	B-4/Test #1 Ohm-Centimeter (Ohm-cm) East-West	Test #2 Resistance (Ohms) North-South	Test #2 Ohm-Centimeter (Ohm-cm) North-South
5	19.05	18,240		
10	13.55	25,950		
15	9.18	26,370		
20	6.66	25,510		
25	5.12	24,510		
30				

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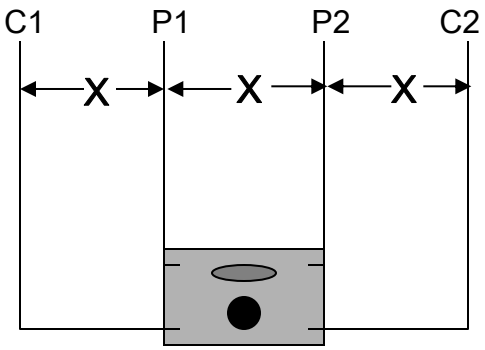
FIELD RESISTIVITY
TEST RESULTS

Ohm-cm = x191.5(R)

X=Spacing (feet)

R=Resistance (Ohms)



SPACING (Feet)	B-5/Test #1 Resistance (Ohms) East-West	B-5/Test #1 Ohm-Centimeter (Ohm-cm) East-West	B-5/Test #2 Resistance (Ohms) North-South	B-5/Test #2 Ohm-Centimeter (Ohm-cm) North-South
5	14.65	14,025	13.60	13,020
10	7.46	14,285	6.36	12,180
15	4.78	13,730	2.94	8,445
20	2.81	10,762	1.89	7,240
25	2.07	9,910	1.18	5,650
30				

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